THE FLOW OF GASES IN FURNACES Based upon the Laws of Hydraulics

PART I

THE APPLICATION OF THE LAWS OF HYDRAULICS TO THE COMPUTATIONSF OR A REVERBERATORY FURNACE

I. THE FUNDAMENTAL VIEWPOINT

HERETOFORE reverberatory furnaces have been constructed with very little, or without any, computation; and the designer has always met with more or less difficulty in establishing the lines for a new furnace or in improving an old furnace which was defective, and forcing it to work in the right manner. This was due to the fact that the technical considerations governing the design of these furnaces had not advanced sufficiently to give any very exact point of view regarding the mechanism of the circulation of the gases within the furnace. If the viewpoint which is proposed below is accepted, the working processes of these furnaces will become completely clear:

We are surrounded, as is everything else amidst which we live, by a liquid w ocean, the air; the reverberatory furnace, which is under consideration, is also immersed in this ocean of air. As the density of this liquid, the air, is 770 times less than that pf water, its presence is hardly noticeable and is very rarely considered. At the same time, it must be admitted that we do not

[1]ATo£e *by the French translators.*—While the word " fluid " would be more appropriate, the word " liquid " has been retained as conveying more exactly the thoughts of the author.